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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/037,847	10/19/2001	Hong-Da Liu	64,600-078	6640

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EXAMINER

SCHECHTER, ANDREW M

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 06/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/037,847

Applicant(s)

LIU, HONG-DA

Examiner

Andrew Schechter

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 October 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☒ Interview Summary (PTO-413) Paper No(s). 2.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because Figures 2a and 3a have unlabeled elements, do not match Figures 2b and 3b (which are fine), and do not correspond to the description in the specification. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "Wide viewing angle fringe field multi-domain aligned LCD with electrically conductive grid and method for fabricating".

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-20 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a fringe-field, multi-domain LCD with two electrodes (as described) on a single substrate, does not reasonably provide

enablement for a fringe-field, multi-domain LCD with two electrodes (as described) on opposing substrates. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

As discussed in the Interview Summary of 12 June 2003, it appears that a typographical error is responsible for this difficulty, and an appropriate correction as discussed there would overcome this rejection. Corrections to the specification are also necessary.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as failing to set forth the subject matter which applicant(s) regard as their invention. Evidence that claims 1-20 fail(s) to correspond in scope with that which applicant(s) regard as the invention can be found in the specification and figures. In that paper, applicant has stated that the two electrodes for producing the fringe-field effect are on the same substrate, and this statement indicates that the invention is different from what is defined in the claim(s) because it places the two electrodes on opposite substrates.

This rejection can be overcome as discussed above. For examination purposes, it is assumed that this has been done, and the claims recite both electrodes being on the first light-transmissive substrate.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1, 2, 15, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by *Watanabe et al.*, U.S. Patent No. 5,995,182.

[Two notes regarding this reference. First, the grid is on the second substrate as recited by the claim, not the first one as the present specification teaches. Second, the grid is a conductive black matrix for the entire substrate, rather than one of the two electrodes; such conductive masks are found in class 349, subclass 111, and their use on either substrate is known; to distinguish the claimed invention from devices where the grid is merely a conductive mask, the examiner suggests reciting that the grid electrode is used to produce the fringe field.]

Watanabe discloses as prior art [see Figs. 1 and 2] a fringe field, multi-domain LCD with two transparent substrates [111, 112], a first electrode [103 or 105] on one substrate, a second electrode [101] forming an electrically conductive, metal grid on the second substrate, and liquid crystal in a cavity formed by the substrates and a peripheral seal [inherent, else the liquid crystal would fall out]. Claims 1 and 2 are

therefore anticipated. Claims 15 and 16 are the method of making this device, so they are also anticipated.

9. Claims 1, 2, 4, 5, 8, 15, 16, and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by *Komatsu*, U.S. Patent No. 6,335,770.

Komatsu discloses [see Fig. 2a] a fringe field, multi-domain LCD comprising transparent substrates [10, 11], an electrically conductive, transparent layer [157], an electrically conductive, transparent, ITO grid [109], with liquid crystal [30] in the cavity formed by the substrates and the [inherent, else the liquid crystal would fall out] peripheral seal. Claims 1, 4, and 5 are therefore anticipated.

As can be seen from Fig. 3, the liquid crystal has positive dielectric anisotropy [the molecules align with an applied electric field], so claim 8 is also anticipated.

Claims 15 and 18 are the method of making the device of claims 1 and 4, so they are also anticipated.

Komatsu also discloses [see Fig. 12] the same structure but with the electrically conductive grid [509] made of an opaque metal. Claims 2 and 16 are therefore anticipated as well.

10. Claims 1, 5-8, 15, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by *Lee et al.*, U.S. Patent No. 6,128,061.

Lee discloses [see Figs. 4 and 7] a fringe field, multi-domain LCD comprising two transparent substrates [30, 50], a first transparent electrode [39], a second transparent electrode [37] being a grid of horizontal and vertical bars, and liquid crystal vertically

aligned liquid crystal [60] filling the cavity between the substrates and the [inherent, as above] peripheral seal. Claims 1, 5, 6, 15, and 20 are therefore anticipated.

The dielectric anisotropy can be either positive or negative [col. 15, lines 51-54], so claims 7 and 8 are also anticipated.

11. Claims 9, 11, and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by *Matsuyama et al.*, U.S. Patent No. 6,469,765.

Matsuyama discloses [see Fig. 9] a fringe field, multi-domain LCD comprising two transparent substrates [802, 902], a first electrically conductive grid [300] of horizontal and vertical bars, a second electrically conductive grid [410, 412, 414], and a liquid crystal having negative dielectric anisotropy [abstract] in the cavity formed by the substrates and a peripheral seal [col. 16, line 35]. Claim 9 is therefore anticipated.

The first grid can be either transparent or metal [col. 12, lines 36-39, col. 21, lines 36-45], and the second grid is transparent [col. 13, lines 12-14], so claims 11 and 12 are anticipated as well.

12. Claims 9, 10, and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by *Kim et al.*, U.S. Patent No. 6,469,764.

Kim discloses [see Fig. 3] a fringe field, multi-domain LCD comprising two transparent substrates [20, 40], a first electrically conductive grid [24] and a second electrically conductive grid [25], and a liquid crystal material with negative dielectric anisotropy [col. 6, lines 30-37] in the cavity between the substrates and a peripheral seal [inherent, as above]. Claim 9 is therefore anticipated.

The grids are metal [col. 9, lines 3-26], so claim 10 is also anticipated. The bars width/pixel ratio is about 1/10, so claim 14 is also anticipated.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 7 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Komatsu*, U.S. Patent No. 6,335,770 as applied to claims 1 and 15 above, in view of *Pausch et al.*, U.S. Patent No. 6,027,665.

Komatsu discloses using liquid crystal which has a positive dielectric anisotropy. For use in these kinds of IPS devices, the use of negative dielectric anisotropy liquid crystals is an art-recognized equivalent to the use of positive dielectric anisotropy liquid crystals, as evidenced by *Pausch* [col. 1, lines 34-45]. It would therefore be obvious to one of ordinary skill in the art to use negative dielectric liquid crystals, motivated by their being equivalent to positive dielectric liquid crystals. Claims 7 and 19 are therefore unpatentable.

15. Claims 3 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Komatsu*, U.S. Patent No. 6,335,770 as applied to claims 1 and 15 above, in view of *Komatsu*, U.S. Patent No. 6,335,770.

Komatsu discloses that the grid electrode [509] is “formed of opaque metals as the fourth embodiment” [sic, col. 8, lines 30-31], and the fourth embodiment discloses that Mo is used for the analogous electrode [409, col. 7, lines 61-63]. *Komatsu* does not say explicitly that [509] is made of *Mo*; however *Komatsu* does teach that using “low resistance metal layers such as Mo” can reduce signal delay problems [col. 8, lines 40-47], and demonstrates that Mo is a suitable material for this use by example. It would therefore be obvious to one of ordinary skill in the art to use Mo as taught and motivated by *Komatsu*. Claims 3 and 17 are therefore unpatentable.

16. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Kim et al.*, U.S. Patent No. 6,469,764 as applied to claim 9 above, in view of *Kim et al.*, U.S. Patent No. 6,469,764.

Kim does not explicitly state the width of the bars in Fig. 3. However, *Kim* does give the widths of the bars in Fig. 1 as “preferably 10-20 μm ” [col. 1, lines 46-48]. Comparing this pixel with the similarly-sized pixel of Fig. 3 [pixel sizes for LCD displays are set by the desired resolution], the bar width would be between 2 and 20 μm and the distance between bars between 10 and 50 μm . Therefore, it would be obvious to one of ordinary skill in the art to use widths within these ranges in the device of Fig. 3, motivated by *Kim*’s teaching of the appropriate size for the bars in Fig. 1. Claim 13 is therefore unpatentable.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 6,088,078 to *Kim et al.* is similar to U.S. Patent No. 6,469,764.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (703) 306-5801. The examiner can normally be reached on Monday - Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-4711 for regular communications and (703) 746-4711 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

AS

Andrew Schechter
June 13, 2003


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